

Model 30-4 Neutron Detector with Digital Display

Features

- Multi-Function Digital Display Unit
- Low-Weight Device Substitutes for Ratemeter
- Simple Switching Between Two Sets of Measurement Units
- Moderated Neutron Detector
- Range: 0 –100 mSv/h (0–10,000 mrem/hr)
- Display Unit Detaches for Greater Versatility



Introduction

The Ludlum Model 30-4 joins the Model 30 digital display unit with a 22.9 cm (9 in.) REM ball containing a ^3He detector, thereby providing a significant weight reduction and more compact, manoeuvrable instrument for determining neutron dose rates. Three modes of operation - RATE, MAX, and COUNT - are available for the user. Measurements can be collected in two sets of units (primary and secondary) for RATE and MAX modes in cps, Bq, dpm, R/hr, rem, or Sv/h units. An internal switch is used to enable or disable the front-panel setup feature to protect desired settings from inadvertent modification. Setup is also available via software available from Ludlum Measurements.

This instrument features a large, easily-readable LCD (liquid crystal display) that may be rotated for maximum ease of use for the operator. The connecting cable is threaded through the rugged carrying handle to simplify use. In addition the display unit may be detached from REM ball permitting the operator to position the detector and the display unit to best advantage within the limits of the cable length. Other features are a piercing audio warning tone and easy, intuitive, user-friendly design. Splash-resistant construction allows the Model 30 to be used in outdoor environments. The unit's body is constructed of lightweight, durable, high-impact plastic

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Specification

INDICATED USE: neutron dose rate

MEASUREMENT RANGE: 0–100 mSv/h (0–10,000 mrem/hr)

DETECTOR: ³He proportional detector, 1.6 x 2.5 cm (0.6 x 1.0 in.) (D x L), surrounded by a 22.9 cm (9.0 in.) diameter cadmium loaded polyethylene sphere

SENSITIVITY: typically 10 cpm per μSv/h (100 cpm per mrem/hr) (bare AmBe neutrons)

LINEARITY: reading within 10% of actual value

ENERGY RESPONSE: provides appropriate inverse RPG curve for neutrons from thermal through 7 MeV, provides response up to 12 MeV

GAMMA REJECTION: < 10 cpm through 0.1 Sv/hr (10 R/hr) (¹³⁷Cs gamma)

OPERATING VOLTAGE: approximately 1200 Vdc

THRESHOLD: -2 mV

WORKING ENVIRONMENT: splashproof shields for outdoor use

HIGH VOLTAGE: 500 V to 1500 Vdc (2 mV to 120 V)

ALARMS: count rate, exposure/dose, and scaler alarm setpoints adjustable over the display range

OVERLOAD: high count rate saturation protection prevents false display of lower count rates

LOSS OF COUNT ALARM PROTECTION: after preselected time interval (default 60 seconds) of no pulses from detector, audible and visual alarms will be activated

LCD DISPLAY: 3 digit LCD with large 13.4 mm (0.53 in.) digits, (k)cps, (k)cpm, (k)Bq, (k)dpm, (μ)(m)R(/h), (μ)(m)Sv(/h), (μ)(m)rem(/h), low-battery indicator, MAX, ALARM, MUTE

DISPLAY RANGE: 0.0 cps to 99.9 kcps; 0.00 cpm to 999 kcpm; 0.00 Bq to 99.9 kBq; 0.00 dpm to 999 kdpm; 0.00 μR/hr to 999 R/hr; 0.00 rem/ hr to 999 rem/hr; 0.00 μSv/h to 999 Sv/h. Display range can be set to limit display to calibrated range

BACKLIGHT: built-in ambient light sensor automatically activates low-power LED backlight, unless internal dipswitch is set to continuous-On (will reduce battery life). Alarm light intensity varies based on ambient light levels.

USER CONTROLS:

- ON/OFF/ACK - press to turn ON, tap to acknowledge alarms and silence alarm tone, press to reset Sigma Audio alarm, turn “click” audio On/Off, turn Sigma Audio beep On/Off, hold for OFF
- MODE - alternates between NORMAL (count rate), MAX (captures peak rate), and COUNT (user-selectable preset count time from 0 to 10 minutes). Number of modes can be reduced in setup.
- UNITS - changes the units between count rate (cpm, cps), dose/exposure (μSv/h, mR/rem/hr), or disintegration (dpm, Bq)

RESPONSE TIME: user-selectable from 1 to 60 seconds, or Auto-Response Rate FAST or SLOW

AUDIO: greater than 75 dB at 0.6 (2 ft), approximately 4 kHz

POWER: two alkaline or two rechargeable “AAA” batteries

BATTERY LIFE: approximately 100 hours of operation, 24-hour low battery warning

CONSTRUCTION: high-impact plastic with water-resistant rubber seals and separate battery compartment

TEMPERATURE RANGE: -20 to 50 °C (-5 to 122 °F), may be certified for operation from -40 to 65 °C (-40 to 150 °F)

ENVIRONMENTAL RATING: NEMA (National Electrical Manufacturers Association) rating of 3x or IP (Ingress Protection) rating of 52 with audio hole seal option (hole seal option will reduce maximum volume by approximately 10 dB)

SIZE: Display Unit 8.5 x 8.0 x 4.8 cm (3.4 x 3.1 x 1.9 in.) (H x W x L); Detector 22.9 cm (9 in.) REM ball with ³He detector (1.6 x 2.5 cm)

WEIGHT: Display Unit 174 g (0.38 lb); REM ball component 6.6 kg (14.5 lb)